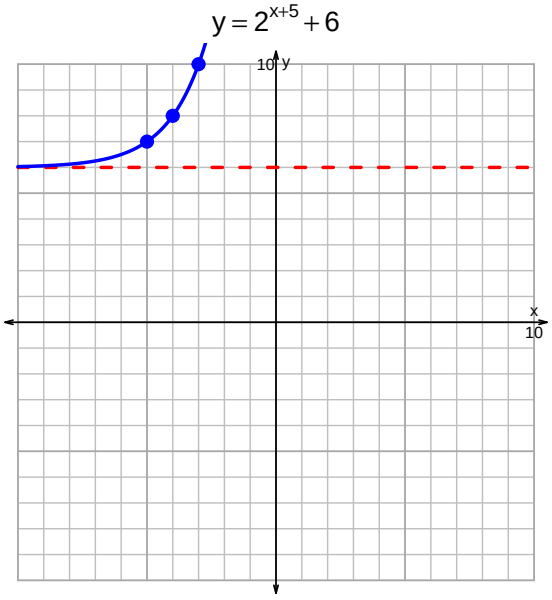
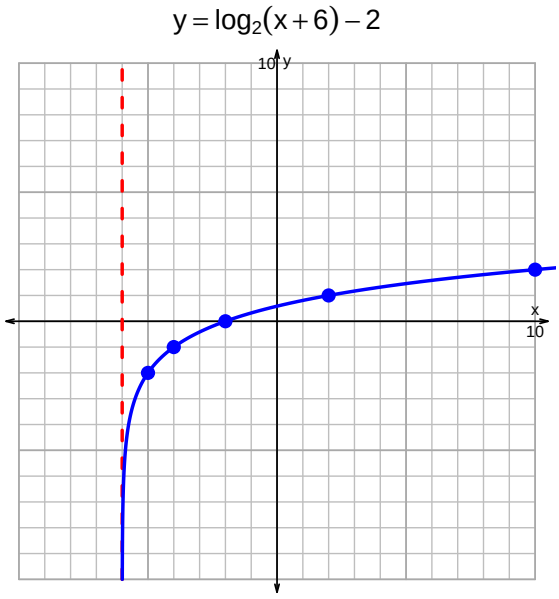
Name: Date:

s18: EXP LOG (SLTN v347)

1. (10 pts) Graph $y = 2^{x+5} + 6$ and $y = \log_2(x+6) - 2$ on the grids below. Also, draw any asymptotes with dashed lines.





Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$13 = \left(\frac{7}{3}\right) \cdot 2^{4t/5}$$

Divide both sides by $\frac{7}{3}$.

$$\frac{13 \cdot 3}{7} = 2^{4t/5}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{13 \cdot 3}{7}\right) = \frac{4t}{5}$$

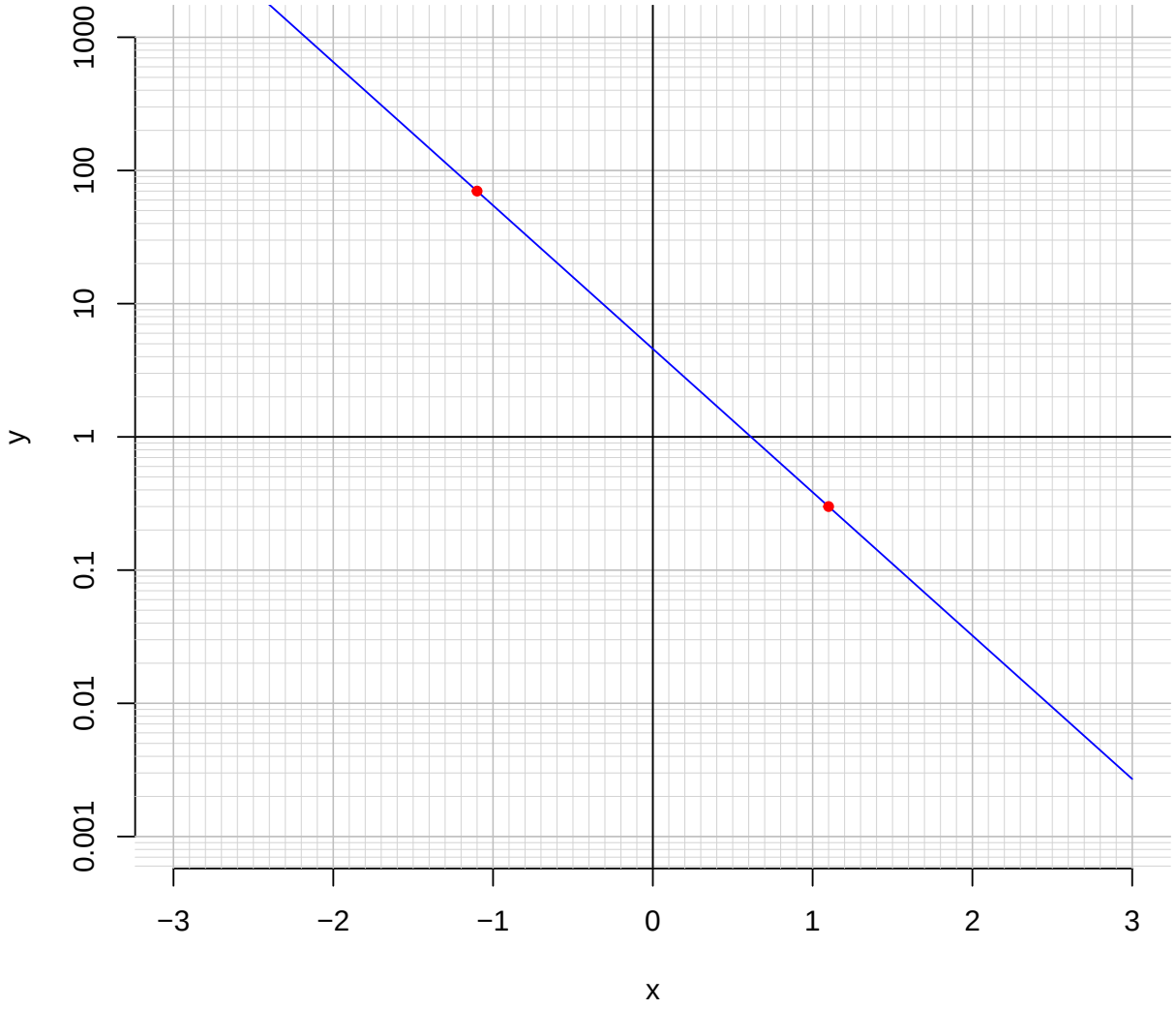
Divide both sides by $\frac{4}{5}$.

$$\frac{5}{4} \cdot \log_2\left(\frac{13 \cdot 3}{7}\right) = t$$

Switch sides.

$$t = \frac{5}{4} \cdot \log_2\left(\frac{13 \cdot 3}{7}\right)$$

3. (10 pts) An exponential function $f(x) = 4.58 \cdot e^{-2.48x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(1.1)$.

$$f(1.1) = 0.3$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{2.48} \cdot \ln\left(\frac{x}{4.58}\right)$$

Using the plot above, evaluate $f^{-1}(70)$.

$$f^{-1}(70) = -1.1$$